UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
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BOSTON, MASSACHUSETTS 02114-2023

July 28, 1999

Mr. Emil Klawitter (eeklawitter@efdnorth.navfac.navy.mil)
Northern Division, Naval Facilities Engineering Command
Code 1823/EK
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

Re: Final Report on Monitoring Event 14 - April 1999 for sites 1, 3 and the Eastern Plume, Naval Air Station, Brunswick, Maine

Dear Mr. Klawitter:

Thank you for the opportunity to review the above report. Because this is a final report, our review focused upon data quality and presentation issues. Attached are our general and specific comments for your consideration in future reports. The major areas these fell into were:

- Data Accuracy and Quality. Overall, very few inaccuracies were observed. We had a few comments regarding well purging and the use of peristaltic pumps for several wells.
- Deep Potentiometric Surface Display. The horizontal gradient display appears to be misleading when compared to the three dimensional geological structures in some areas.
- VOC Contour Display. Is not as accurate as possible in some areas.
- In making the monitoring event reports a "just the data" document it's easy to omit observations in the text that would aid in comprehension; see specific comments.

Several of these issues go beyond the intended scope of the monitoring event reports. We will also provide these comments to the 1998 annual report and recommend that they be discussed at a future technical meeting. Future reports can then reflect the project team consensus reached. Finally, we'd like to commend the Navy and EA on the very timely submission of this monitoring event report. If you have any questions, please contact me at 617-918-1344 or barry.michael@epa.gov.

Sincerely,

Michael S. Barry
Remedial Project Manager
Federal Superfund Facilities Section

Attachment
Enclosures

cc. Ed Benedikt/Brunswick Conservation Commission (rbenedik@gwi.net)
Rene Bernier/Topsham Community Rep.
Tom Fusco/BACSE

Carolyn LePage/LePage Environmental (clepagegeo@aol.com)
Steve Mierzekowski/USFWS (steve_mierzykowski@mail.fws.gov)
Pete Nimmer/EA Environmental (pln@eaest.com)
Claudia Sait/ME DEP (claudia.b.sait@state.me.us)
Tony Williams/NASB (WilliamsA@nasb.navy.mil)

Attachment

General Comments. We expect the response to many of EPA's comments is probably to the effect that the comment is noted at this time and will be discussed at a future technical meeting.

1. **Data Accuracy and Quality.** These issues were similar to prior sampling events.

   a. Well Purging. Six wells that had less than one saturated-screen volume purged prior to sampling without. Though these wells achieved technical stabilization, it' s not clear that the samples are representative of ambient conditions. EPA and ME DEP have commented in the past about not purging wells dry; was this the reason these wells were not fully purged? Without a note in the text we cannot evaluate this. In addition, several wells (MW-207A and MW-331) were purged at rates of 1.6 and 1 liters per minute respectively, in excess of low-stress methodology.

   b. Peristaltic pumps were used for five wells though a review of Appendix A.2 reveals that this doesn't appear to have impacted the sample results in this event because the high dissolved oxygen readings for MW-105A and P-111 seem to be the result of other factors. However, as indicated the past, the use of peristaltic pumps can affect dissolved oxygen, pH, and the quantity of volatile components. In its Event 13 comment responses, the Navy indicated that dedicated submersible pumps were already used all possible locations, and that peristaltic pumps are used in wells too narrow to use submersible pumps. However, of the five wells that were purged with peristaltic pumps three are standard 2 inch monitoring wells (MW-105A, MW-330, and MW-333). Consequently, it's not clear why peristaltic pumps have been used in these cases.

2. **The Deep Potentiometric Surface.** Figures 8 and 10 depict the generally accepted interpretation of deep groundwater flow to Merriconeag stream in the vicinity of MW-309B. This is in contrast to the deep flow interpretation of the 1991 E.C. Jordan study, and to the observed plume flow of the northern lobe. Closer inspection of the potentiometric surface reveals that this interpretation is highly dependent on incorporating MW-309B in the contouring process. However, to incorporate MW-309B in the deep flow contouring, one must assume that there is a good connection between the deep coarse sand and the bedrock shoulder that MW-308 and MW-309B reside in. There is considerable evidence to suggest this may not be true.

   a. Figure 1 (enclosed in hard copy letter only) contains a geologic cross-section that includes MW-308 and MW-309B. Contrary to the interpretation of Figure 1, there is no physical evidence to indicate that coarse sand directly contacts bedrock near MW-308. Rather, the transition layer is interpreted to enclose the coarse sand on 3 sides, to the North and South and may do so here as well. The significant confining nature of the transition layer may have resulted in the lack of significant contamination observed in surface water sampling, and at MW-308 and MW-309B. Furthermore, the 2 wells MW-309A and MW-309B, installed in bedrock capped by clay, demonstrate significant vertical flow upward, from a source likely within the sharp bedrock rise to the East, rather than from a source in the West.

   b. Recommendation. Until contamination is discovered East of the deep coarse sand layer, consider the eastern edge of the coarse sand layer to be a no-flow or very-low-flow boundary. Review the wells and piezometers available for gauging the eastern edge of the deep coarse sand, and modify the long-term monitoring plan to increase the spatial

resolution of the well network along the eastern edge. After these steps, contouring of the deep potentiometric surface should more accurately reflect observed plume flow.

c. Resolution of this comment to be deferred to a future technical meeting.

3. **VOC Contour Display, figure 14.**

a. Plume coverage. There is no physical evidence to indicate that the plume disappears in the 400 or so feet between EW-4 and MW-331. On the contrary, plume flow had to have historically existed in this area and was depicted as such in the monitoring event report 13 report (figure 14). Thus, it's likely a single plume exists, rather than two separate lobes.

b. 100 ppb VOC contour. The VOC concentrations at P-105 historically tracked those of P-106; this was confirmed in the Geostatistical Assessment. Though EPA concurred with removing P-105 from the LTMP, we are certain the plume remains north of EW-5.

c. Recommendations. Modify figure 14 in the1999 annual and future monitoring reports by:

i. Extend the northern 100 ug/L contour around P-105.

ii. Join the two lobes into a single plume, such as a composite of figure 14 for events 13 and 14. If VOC concentrations of EW-4 or MW-331 drop-off significantly, or physical evidence is developed to indicate that the plume no longer exists between these 2 wells then the plume could again be separated into two lobes.

d. Resolution of this comment to be deferred until a future technical meeting.

4. At the meeting to discuss the above, we also recommend discussing the use of sediment vapor head diffusion samplers as a substitute for surface water sampling. Bimonthly water-level readings also seem to be providing little additional information and EPA believes could be discontinued.

5. EPA strongly concurs with the "just the data" format of the monitoring event reports. Sections 1.2 on water levels and 1.3.3 on general water quality had a few observations which were very helpful. Similar brief, observations on surface (1.4) and groundwater (1.3.5) results would be helpful as well. An example for this report would that no VOC's that are also COC's were detected in eastern plume surface water samples.

Specific Comments

6. **Section 1.2.1, Para. 1; Figures 5, 8 and 9.** Bimonthly water-level data; see comment 4.

7. **Section 1.2.2, Para. 2 (editorial).** "Presumscot" should be "Presumpscot".

8. **Section 1.2.2 and figure 12.** MW-217A level rose sharply, was anything unusual observed? Individual data points shouldn't be taken out of context of the trend, but this is clearly an unexpected result. The last well that exhibited a sudden rise was later found to have a cracked casing.

9. **Section 1.2.2, Para. 3.** See comment 2.a. Pending resolution of evidence that contradicts the inference that shallow bedrock well MW-309B is representative of the deep flow this discussion should be modified in the 1999 annual report.

10. **Section 1.3.3.2.** Please incorporate a bullet regarding the lack of the Eh stabilization for MW-330 into the related section of the annual report.

11. **Section 1.3.3.2, Bullet 2.** Dissolved oxygen concentrations approaching saturation were noted for MW-105A and P-111, among others. Yet purging conditions of these two wells cast doubt that ambient groundwater conditions were accurately represented. Recommend avoiding these conditions in future events if possible.

    a. P-111. Appendix A.2 indicates that the well was purged with a peristaltic pump at a relatively high rate, given its small casing diameter. A complete well volume was purged every three minutes, and drawdown was not measured. This relative high rate could have contributed to the elevated dissolved oxygen reading, if drawdown was sufficient to allow aeration of inflow.

    b. MW-105A. Appendix A.2 indicates a purge volume of only 2.5 L against a well volume of 27.4 L. It's possible that the sample drawn is more representative of standing water in the well exposed to the atmosphere rather than ambient groundwater conditions.

12. **Section 1.5.1.** We concur to the landfill cap engineering inspection observations and look forward to the repair completion report.

13. **Figure 4 and Table 1.** Please add gas vent and gas probe locations to this figure in future reports..

14. **Table 5 (Editorial).** Erroneous entries for EW-4 after 12/31/98, 1/31/99 and 3/31/99.

15. **Appendix A.2. Field Records of Well Gauging, Purging and Sampling.** When peristaltic pumps are used, please have field personnel note this on these forms. Such notation was not performed for Event 14.

16. **Appendix A.2.** Purging rates and volume purged were reviewed for all wells. Six wells (MW-105A, MW-203, MW-229 and MW-306, MW-308 and MW-319) had less than one saturated screen interval purged. Regardless of parameter stabilization achieved, this calls into question whether the drawn samples truly represented ambient groundwater conditions. On the other hand, it should be noted if purging was limited in order to prevent purging the well dry (previous EPA and ME DEP comments)!

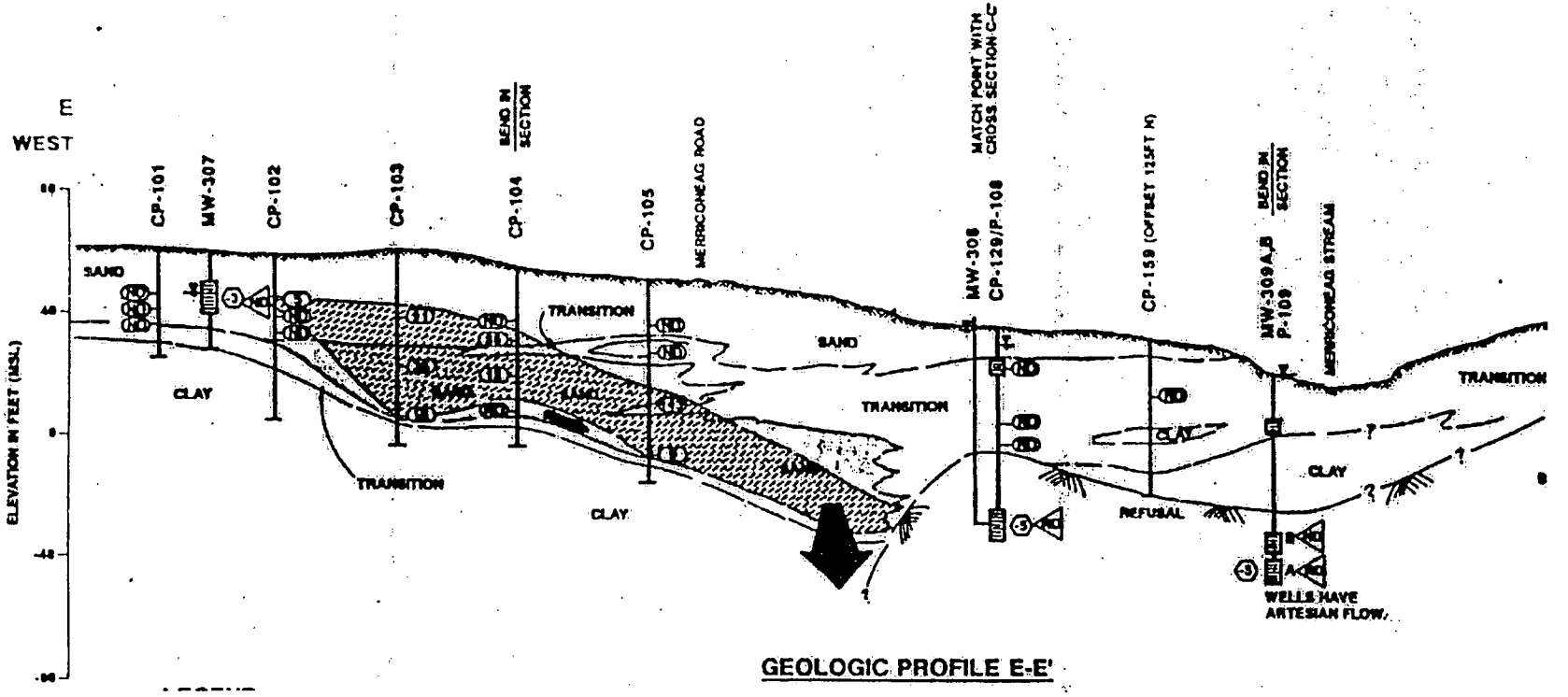
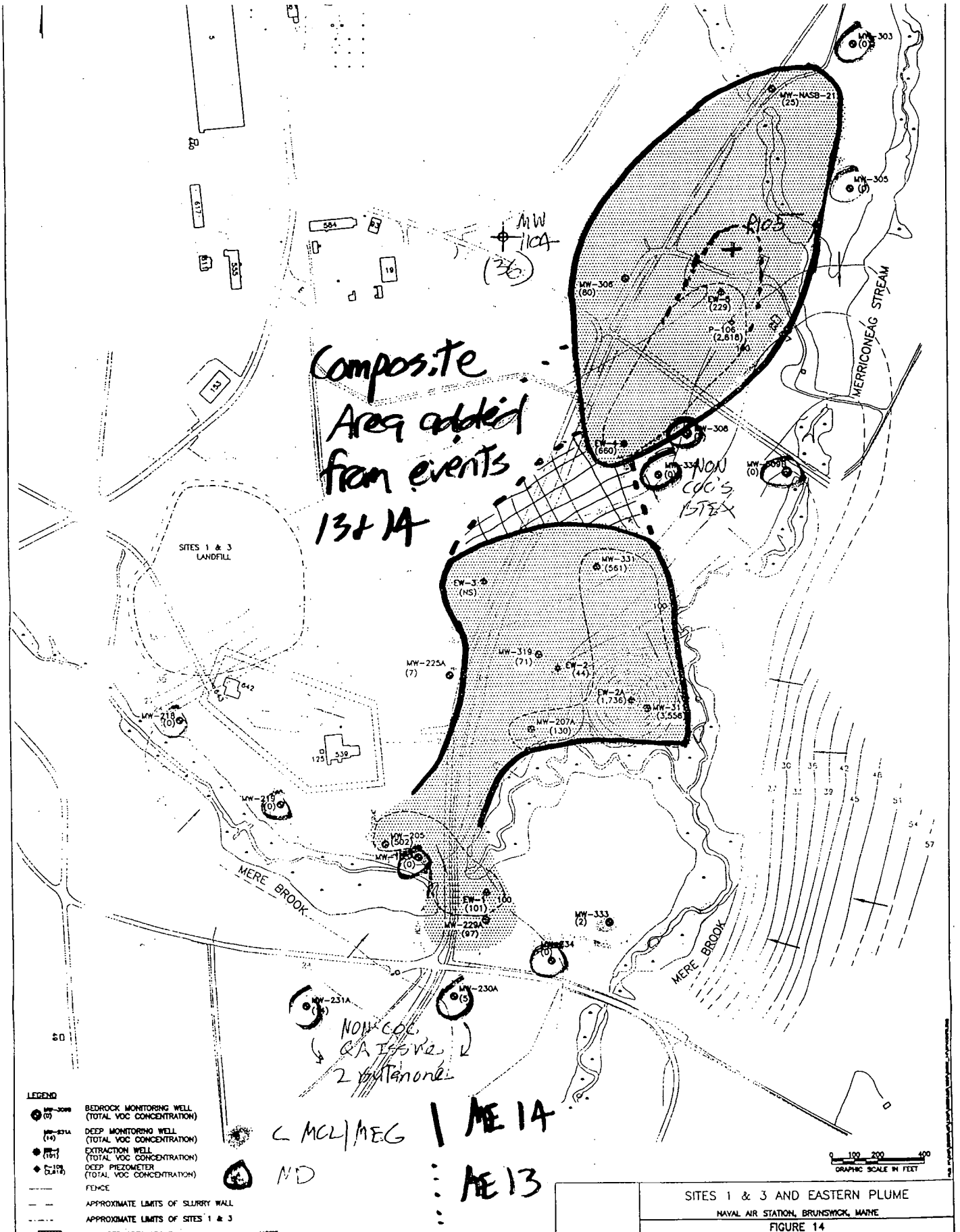


Figure 1. The geologic cross-section from the 1991 E.C. Jordan study that includes MW-309B, and depicts deep plume flow to the South, contrary to the current 2 dimensional flow-net. The current flow-net predicts deep flow to Merriconeag Stream by assuming that shallow bedrock well MW-309B is representative of the deep flow system. Very likely, the deep coarse sand is isolated from MW-309B by the clay and transition layers.



LEGEND

- BEDROCK MONITORING WELL (TOTAL VOC CONCENTRATION)
- DEEP MONITORING WELL (TOTAL VOC CONCENTRATION)
- EXTRACTION WELL (TOTAL VOC CONCENTRATION)
- DEEP PIEZOMETER (TOTAL VOC CONCENTRATION)
- FENCE
- APPROXIMATE LIMITS OF SLURRY WALL
- APPROXIMATE LIMITS OF SITES 1 & 3
- INFERRED AREA ABOVE STATE MEG/FEDERAL MCL CONCENTRATION
- 100 ug/L TOTAL VOC CONTOUR (DASHED WHERE INFERRED)
- NS NOT SAMPLED
- GROUND-WATER CONTOUR (FT MSL) FOR 1-2 APRIL 1999 FROM FIGURE 10 (DASHED WHERE INFERRED)
- INFERRED GROUND-WATER FLOW DIRECTION

NOTE:

1. SITE PLAN TAKEN FROM THE INTEGRAPH VERSION 5 BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995.
2. CONTOURS REPRESENT EVALUATION OF PROBABLE CONDITIONS BASED ON PRESENTLY AVAILABLE DATA. SOME VARIATION FROM THESE CONDITIONS MUST BE EXPECTED.

SITES 1 & 3 AND EASTERN PLUME

NAVAL AIR STATION, BRUNSWICK, MAINE

FIGURE 14

INTERPRETED TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATION CONTOUR MAP DEEP WELLS, MONITORING EVENT 14

DATE	9 JUNE 1999
DESIGNED BY	PLN
DRAWN BY	SAP
CHECKED BY	PLN
PROJECT MANAGER	CEM
PROJECT NUMBER	29000.47
SCALE	1"=400'
FILE NAME	dpwoopr.DWG
DRAWING NUMBER	-
SHEET NUMBER	-

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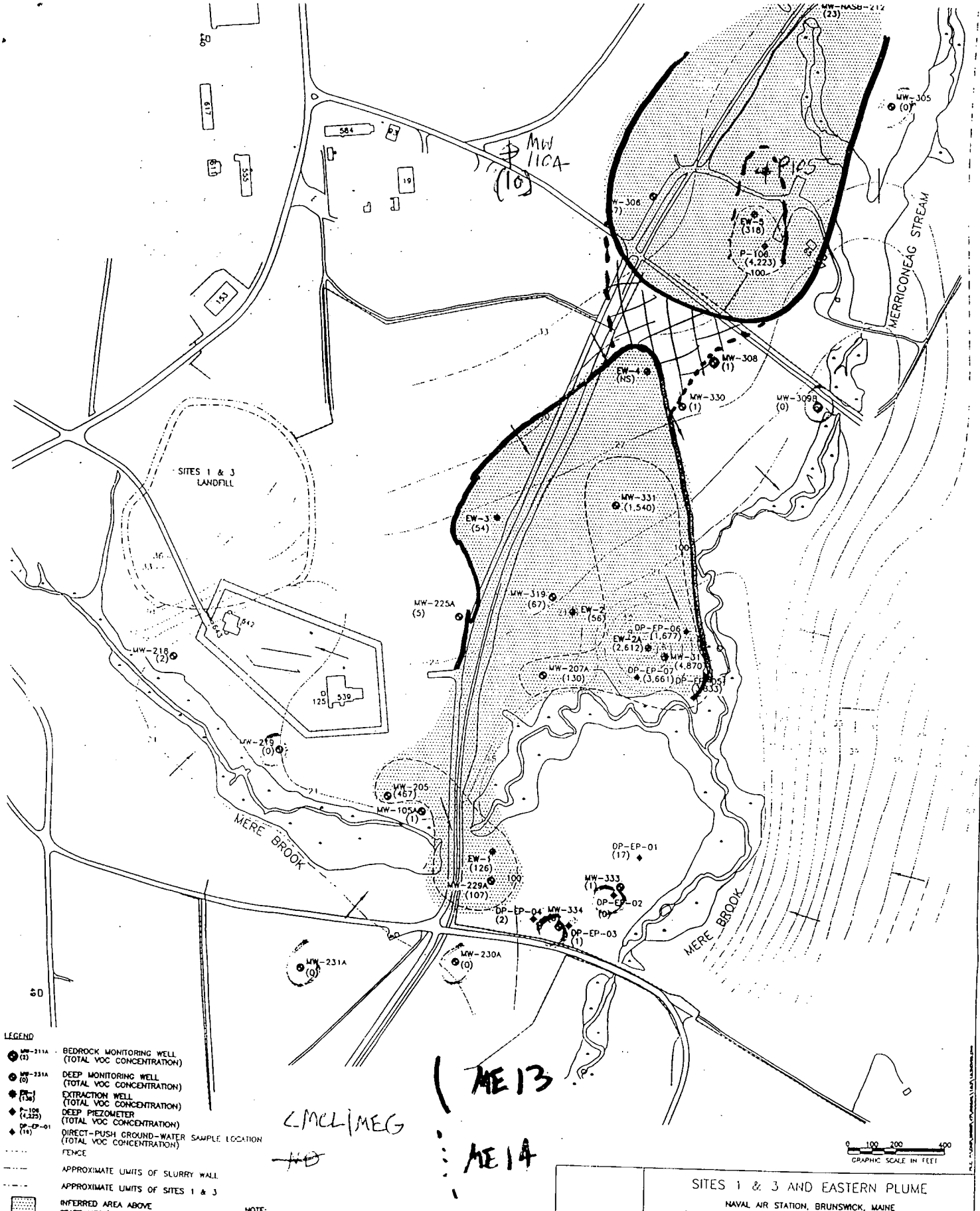

LEGEND

- BEDROCK MONITORING WELL (TOTAL VOC CONCENTRATION)
- DEEP MONITORING WELL (TOTAL VOC CONCENTRATION)
- EXTRACTION WELL (TOTAL VOC CONCENTRATION)
- DEEP PIEZOMETER (TOTAL VOC CONCENTRATION)
- DIRECT-PUSH GROUND-WATER SAMPLE LOCATION (TOTAL VOC CONCENTRATION)
- FENCE
- APPROXIMATE LIMITS OF SLURRY WALL
- APPROXIMATE LIMITS OF SITES 1 & 3
- INFERRED AREA ABOVE STATE MEG/FEDERAL MCL CONCENTRATION
- 100 ug/L TOTAL VOC CONTOUR (DASHED WHERE INFERRED)
- NS NOT SAMPLED
- GROUND-WATER CONTOUR (FT MSL) (DASHED WHERE INFERRED)
- INFERRED GROUND-WATER FLOW DIRECTION

NOTE:

1. SITE PLAN TAKEN FROM THE INTEGRAPH VERSION 5 BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995.
2. CONTOURS REPRESENT EVALUATION OF PROBABLE CONDITIONS BASED ON PRESENTLY AVAILABLE DATA. SOME VARIATION FROM THESE CONDITIONS MUST BE EXPECTED.

SITES 1 & 3 AND EASTERN PLUME

NAVAL AIR STATION, BRUNSWICK, MAINE

FIGURE 14

INTERPRETED TOTAL VOC CONTOUR MAP DEEP WELLS, MONITORING EVENT 13

DATE	10 JANUARY 1999
DESIGNED BY	PLN
DRAWN BY	SAP
CHECKED BY	PLN
PROJECT MANAGER	CEM
PROJECT NUMBER	29900.47
SCALE	1" = 100'
FILE NAME	1&3NOV98.DWG
DRAWING NUMBER	-
SHEET NUMBER	-

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